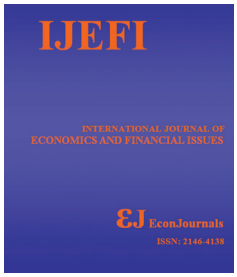


International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2017, 7(5), 400-412.

South Africa's Financial Spillover Effects on Growth and Financial Development in the Southern African Development Community

Alex Bara[1]*, Pierre Le Roux[2]

[1]Agricultural Bank of Zimbabwe, Harare, Zimbabwe, [2]Nelson Mandela University, Port Elizabeth, South Africa.
*Email: alexabara15@gmail.com

ABSTRACT

The study assesses the spillover effects of shocks to South Africa's financial sector on economic growth and financial development of other Southern African Development Community (SADC) countries. The study uses generalized impulse response and vector decomposition of Bayesian vector auto regression estimations applied on a panel data framework. The results indicate presence of positive, but weak, spillover effects on economic growth of other SADC countries, with the spillovers more pronounced in the credit market. Direct spillovers from financial sector in South Africa to financial sector of other SADC countries are also positive and relatively significant in the credit market than in the money market. Implicitly, the credit market can effectively transmit financial spillovers from South Africa into the region. Underdeveloped financial systems of other SADC countries, trade imbalances, strong real sector spillovers, and financial "spillbacks," however, combine to constrain financial spillovers from South Africa.

Keywords: Economic Growth, Financial Development, Financial Spillovers, Southern African Development Community, South Africa
JEL Classifications: R12, H13, R15, O16, G20

1. INTRODUCTION

Financial spillover effects encompass the direct impact of country-specific developments on financial markets elsewhere (IMF, 2016). The transmission mechanisms through which fundamentals in one financial market affect other markets are dependent on the inter-linkages of the markets. In the Southern African Development Community (SADC)[1] region, South Africa has strong ties with other countries in the SADC region, which potentially facilitate financial spillovers. The prevailing financial development imbalances across SADC countries are, however, not consistent with the obtaining financial and economic interconnectedness and linkages between South Africa and other SADC countries. This imbalance raises questions as to whether there are any financial spillovers from South Africa that support growth and financial development in other SADC countries.

In SADC, South Africa remains the most financially advanced economy, including in Africa (Canales-Kriljenko et al., 2013), followed a distant further by Mauritius, Botswana and Namibia with fairly developed financial markets and Democratic Republic of Congo (DRC), Madagascar and Malawi having the least developed financial markets (KPMG, 2014). South Africa's dominance in Africa implies that any shocks or changes to its financial sector are likely to affect other regional countries. Rather, the effects of changes in South Africa's financial development are likely to vibrate across other SADC countries. Literature is, however, not specific on how changes in the financial sector of South Africa affect economic growth or financial development of other SADC countries. The structural set up of financial systems in SADC indicates that financial spillovers are bound and their effects need to be empirically tested.

This study seeks to establish the nature and magnitude of financial spillovers from South Africa to other SADC countries. Precisely, the study assesses how shocks to financial development in South Africa affect economic growth and financial development of

1 SADC is a Regional Economic Community comprising 15 Member States; Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

other SADC economies. The empirical evidence in this study provides new knowledge in understanding the dynamics in financial spillovers in SADC, in particular the effectiveness of the financial sector and the transmission channels (mechanisms) for financial development in the region.

The study uses generalized impulse responses and variance decompositions analysis from Bayesian vector auto regressions (BVARs), following Canales-Kriljenko et al. (2013).

2. LITERATURE REVIEW

Economists and geographers acknowledge the strategic role played by spillovers, an instance of overflowing or spreading into another area, in explaining regional growth and development. Cross-border spillovers occupy an important place in the international finance literature (Gębka and Serwa, n.d.). Spillovers in finance are more prominent and analyzed in stock and financial markets, with effects pronounced highly during crises than in normal periods (IMF, 2013). Shinagawa (2014) defined financial market spillovers as the co-movement between two countries' financial markets. An alternative, less standard definition of financial spillovers encompass the direct impact of country-specific developments on financial markets elsewhere (IMF, 2016).

Financial development in one country may have spillover effects on neighboring country's growth or financial sector (Yildirim et al., 2006). A deterioration of financial conditions may affect the economy through a decline in consumption and investment, or through credit rationing (Ciccarelli et al., 2012). Financial linkages, as measured by exposure to a financially developed economy, also seem to exert an effect on cross country correlation as trade or macroeconomic linkages (Baldacci et al., 2013). The 2007/2008 global crisis generated increased interest in understanding the extent to which the interdependencies in trade and financial linkages among countries contribute to spillover effects (Angkinand et al., 2009). Cross-border market linkages have increased the likelihood for shocks in an economically and financially developed country to be transmitted internationally (Angkinand et al., 2009). Sudden breaks in these inter-market linkages create shocks that have ripple effects across markets (Gębka and Serwa, n.d.).

The transmission mechanisms through which fundamentals in one financial market affect other markets are dependent on the inter-linkages of markets. The IMF (2016) acknowledges that financial market integration strengthens the importance of financial factors in explaining spillovers relative to trade linkages. Spillovers increases between countries with similar macro-financial fundamentals and are strongest within sectors (IMF, 2016). Possible channels through which financial market spillovers occur include bilateral portfolio investment, bilateral trade, home bias, and country concentration (Shinagawa, 2014). Channels that create macroeconomic and financial linkages enhance spillovers across economies.

Nissanke (2009) indicated that the transmission channels of the global financial crisis of 2007 for emerging market economies filtered through currency depreciation, stock market prices, bond and debt financing, syndicated loans and private debt and equity capital flows. For low-income developing countries, the global financial crisis transmitted through price movements on commodity markets, availability and cost of trade finance and marked reduction in remittance flows (Nissanke, 2009). For countries, monetary policy transmits through interest rates, the exchange rate and the credit (Christensen, 2014). Inefficiencies in financial intermediation by banks, imperfect competition and improper intermediation of funds in low income countries lead to the impairment of these transmission channels (Mishra et al., 2010).

Globally, spillovers in the financial area have mostly been analyzed in stock and financial markets. Fic (2013) found that the impact of quantitative easing on the developing economies varied across countries depending on scale of exposure to the developed countries and the stability of their financial systems. Brugal (2012) finds higher connectedness among Latin America's stock markets which produced volatility spillovers with jumps in fragile periods and return spillovers that are evolving gradually. Beaton and Desroches (2011) showed that shocks to U.S. output have financial spillovers that are rapidly transmitted to Canada. Ciccarelli et al. (2012) investigated heterogeneity and spillovers in macro-financial linkages across developed economies and found evidence of spillovers across countries and between real and financial variables.

In the SADC region, South Africa has strong ties with other countries in the SADC region, which facilitate spillovers. South African financial firms have branches and subsidiaries in SADC countries (Berkowitz et al., 2012). A number of South African financial institutions, including banks, insurance companies and investment management are spread across regional countries (Canales-Kriljenko et al., 2013). Development institutions in South Africa have provided funding for projects in Southern Africa and beyond. South Africa's currency, the Rand is a legal tender in four regional countries, Namibia, Lesotho, Swaziland and Zimbabwe. This notwithstanding, there is no, known, literature on financial spillovers in the SADC countries.

Literature, however, points to the existence of real spillovers from South Africa (Kabundi and Loots, 2007; Arora and Vamvakidis, 2005). Kabundi and Loots (2007) found evidence of strong and significant co-movement of the South African business cycle with those of Swaziland, Botswana, Zimbabwe, the DRC, Lesotho and Angola; moderate with Mozambique, Mauritius and Namibia and no significant co-movement with Malawi and Zambia. The results also indicated a high degree of correlation between South Africa's common gross domestic product (GDP) component and the common components of other countries (with correlation coefficients ranging from 0.59 to 0.99). Ruch (2013) pointed out that the South African economy was significantly affected by the financial crisis of 2008 through spillovers.

Basdevant et al. (2014) found no evidence of real growth spillovers from South Africa to the rest of the continent over the period 1960-2009. Canales-Kriljenko et al. (2013), using panel estimations

and VARs, found substantial spillovers from South Africa into other SACU members, reflecting sizeable real and financial inter-linkages. Arora and Vamvakidis (2005), using standard panel growth regressions, found positive and statistically significant spillovers in long-term growth rates. The authors concluded that a one percentage point increase in South Africa's long-term growth rate is associated with a 0.5-0.75% increase in long-term growth rates in the rest of sub-Saharan Africa (Basdevant et al. 2014).

Beyond real spillovers, the high level of interconnectedness of economies and linkages of financial systems that exists between South Africa and other SADC countries presents opportunities for financial spillovers Canales-Kriljenko et al., 2013).

3. DATA AND METHODOLOGY

3.1. Methodology

Generally, VAR models are used in the estimation of spillovers across countries or regions. Application of generalized VAR model facilitates complete characterization of possible volatility interactions between markets (Duncan and Kabundi, 2011). Ordinarily studies using panel data framework normally employs panel VAR (PVAR) models as they add a cross-sectional dimension to the representation of the ordinary VAR models (Canova and Ciccarelli 2013). The PVAR technique combines the traditional VAR approach, which treats all the variables in the system as endogenous, with the panel-data approach, which allows for unobserved individual heterogeneity (Drakos and Konstantinou, 2011).

Following, Drakos and Konstantinou (2011) we specify a panel VAR model with k lags as follows:

$$y_{it}=\mu_0+A_1y_{it-1}+\ldots+A_ky_{it-k}+a_i+\lambda_t+\mu_{it},\ i=1,\ldots,N;\ t=1,\ldots,T \quad (1)$$

Where, A_j are a 5 × 5 matrices of estimable coefficients; α_i denotes unobserved country-affects; λ_t denotes time-effects; and μ_{it} is a 5 × 1 vector of well-behaved disturbances; y_{it}=($GGDPPC_{it}$,$DCSA_t$, $BCPSA_t$,$LLSA_tM2SA_t$) is a five-variable random vector, composed of economic growth and measures of financial development to be used for the finance-growth spillovers. Similarly, the set of five-variable random vectors composed of measures of financial development to be used for the finance-finance spillovers are as follows:

y_t=($DCxSA_{it}$, $DCSA_t$, $BCPSA_t$, $LLSA_tM2SA_t$), y_t=($BCPxSA_{it}$, $DCSA_t$, $BCPSA_t$, $LLSA_tM2SA_t$), y_t=($LLxSA_{it}$, $DCSA_t$, $BCPSA_t$, $LLSA_tM2SA_t$), y_t=($M2xSA_{it}$, $DCSA_t$, $BCPSA_t$, $LLSA_tM2SA_t$)(2)

Where xSAdenoted variables for all other SADC countries excluding South Africa.

The model in equation (2) imposes the restriction that the underlying structure is the same for each cross-sectional unit, that is, the coefficients in the matrices A_j are the same for all countries in the sample (Drakos and Konstantinou, 2011). To address possible violation of this restriction, the model allows for "individual heterogeneity" in the levels of the variables by introducing fixed effects, denoted by a_i in the model (Drakos and Konstantinou, 2011).

This study employs a BVAR model[2], applied to PVAR to analyze the reaction of other SADC countries growth or financial development to shocks in South Africa's financial system. The BVAR estimation has strengths and advantages over ordinary VAR models. BVAR generally produces accurate forecasts compared to ordinary VAR (Koop, 2013). VARs require estimation of a large number of parameters, often resulting in over-parameterization of VAR models (too few observations to estimate the parameters of the model). A BVAR method solves this problem through shrinkage, by imposing restrictions on parameters to reduce the parameter set (Litterman, 1986; Sims and Zha, 1998). The BVAR allows prior information about the variables of interest to be incorporated into the system of equations (Banbura et al. 2010). The use of prior information assists in mitigating the problem associated with estimations that are performed using a short time span of data.

The general BVAR is expressed as shown in equation (3) below (Litterman, 1986):

$$Y_{it}=c_1+A_1Y_{it-1}+\ldots\ldots\ldots A_pY_{it-p}+\mu_{it} \quad (3)$$

Where Y_{it} a vector of endogenous variables with linear dynamics $A_1\ldots\ldots A_p$ is a vector of autoregressive coefficients and μ_{it} is an n-dimensional matrix of error terms.

In this study, however, the individual effects are considered constant on the assumption that interdependences across other countries than with South Africa were not considered. In other words, the model in this study does not allow for interdependence and cross sectional heterogeneity of units (countries) that result in establishing specific coefficients for each unit. The rationale is that interdependences across other countries than with South Africa were not considered and that feedback shocks to South Africa, although acknowledged, are not part of the model or analysis.

3.1.1. Impulse response function (IRF) and variance decomposition

In analyzing the results from a VAR model, one can use IRF and forecast error variance decomposition (FEVD) (Hassan et al., 2011). An IRF traces the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables (Gil-Lafuente et al., 2012; Lada and Wójcik, 2007). FEVD permits inferences to be drawn regarding the proportion of the movement in a particular time-series due to its own earlier shocks *vis-`a-vis* shocks arising from other variables in the VAR (Enders, 1995). Breaking down the variance of the forecast errors

2 Panel VARs are particularly suited to analyzing the transmission of idiosyncratic shocks across units and time (Canova and Ciccarelli 2013). The current study, however, would not use panel VAR models because of the assumption that interdependences across other units (countries), except with South Africa, have not been considered. Secondly, the large number of parameters is the main difficulty with VAR models, more so panel VAR models. Without prior information, it is hard to obtain precise estimates of so many coefficients and, thus, features such as forecasts and impulse responses will tend to be imprecisely estimated (Agudze, 2013).

for each variable following a shock to a particular variable makes it is possible to identify variables that are strongly affected (Shan and Jianhong, 2006).

The general IRF is expressed as:

$$y_{(t+n)} = \sum_{i=0}^{\infty} \varnothing_i \in_{t+n-i} \{\varnothing_n\}_{t,j} = \frac{\partial_{(it+n)}}{\partial \in_{jt}} \quad (4)$$

Indicating the response of $y_{i,t+n}$ to a one-time impulse in $y_{j,t}$ with all other variables dated t or earlier held constant. The response of variable i to a unit shock (forecast error) in variable j is sometimes depicted graphically to get a visual impression of the dynamic interrelationships within the system.

From equation 2, a Generalized Impulse Response would measure the effect of a typical (historical) shock in variable, $y_{l.it}$ on the system of equations. One way to interpret these is as the effect a change y_{li} by ζ_l at time t has on the expected values of the whole stochastic vector y_{it} at time t+n.

In estimating impulse responses, the current study uses Pesaran and Shin's generalized Impulses method to orthogonalize the shocks ahead of the Cholesky method. The Cholesky decomposition method is dependent on ordering of endogenous variables and the challenge is that there is no scientific way of determining the order of variables. In this case is difficult to determine the importance of the variables under study in terms of their exogenous significance to economic growth or financial development. The generalized IRF addresses the problem of dependence on ordering of variables (Lin, 2006).

3.2. Data and Variables

This study uses annual data for 15 SADC countries, covering the period 1985-2014. Data were obtained from the World Bank's World Development Indicators Database (2015) and the global financial development database for 2015. The variables used for testing financial spillovers are presented in Table 1.

In this study, all the variables indicated xSA are for other SADC countries excluding South Africa. However, for convenience, going forward the term xSA will be dropped on all the variables. Domestic credit (DC), liquid liabilities (LL), bank credit to private sector (BCP) and broad money (M2) are used as proxies for financial development. A priori expectations are that the four measures of financial development in South Africa, have a positive spillover effects on economic growth (growth in real gross domestic product per capita [GGDPPC]) and on financial development of other SADC countries.

Variables used for measuring financial development and economic growth, however, require some justification. The rationale is that what represents an appropriate measure of financial development proved to be controversial in the literature (Ghirmay, 2004). Variables used in literature and in this study capture the degree of financial intermediation, efficiency of the financial sector, monetization of the financial system, the role of commercial banks in allocating funds, and the relative importance of the stock market (Lawrence and Longjam 2003).

DC capture the full degree of intermediation in developing countries, as governments - which provide infrastructure for economic development - often borrow from the financial markets (Adusei, 2012). Government borrowing not only affects credit to other sectors in domestic markets but often also invite interference by government in the markets as well. Bank credit to the private sector is often used as a proxy for measuring financial development in literature as it represents an accurate indicator of the quantity and quality of investment (Beck et al., 2000). LL consist of currency held outside the bank system plus interest-bearing total deposit liabilities of banks and other financial institutions. It also reflects the overall size of the financial intermediary sector in a country. Broad money is traditionally used as a financial deepening indicator (King and Levine, 1993a). Economic growth is measured by real GDP per capita, following King and Levine (1993a) as it goes beyond indicating a country's economic size through income stock but also captures distribution this income, enabling cross-country comparisons.

4. EMPIRICAL RESULTS

4.1. Financial Development in SA on Growth of other SADC Countries

This section presents results of the spillover effects of financial development in South Africa on economic growth of other SADC

Table 1: Variables description

Variable	Description	Definition
GGDPPC	Growth in real gross domestic product per capita (GDPPC)	Growth in real gross domestic product per capita
DC (xSA)	Domestic credit (excluding South Africa)	Total credit by the financial sector as a proportion of GDP in other SADC countries excluding South Africa
LL (xSA)	Liquid liabilities (excluding South Africa)	M3/GDP for other SADC countries excluding South Africa
BCP (xSA)	Bank credit to private sector (excluding South Africa)	Total credit by banks to private sector as a proportion of GDP in other SADC countries excluding South Africa
M2 (xSA)	Broad money (excluding South Africa)	Broad money to GDP in other SADC countries excluding South Africa
DCsa	Domestic credit in South Africa	South Africa's total credit by the financial sector
LLsa	Liquid liabilities in South Africa	South Africa's M3/GDP
BCPsa	Bank credit to private sector in South Africa	South Africa's Total credit by banks to private sector
M2sa	Broad money in South Africa	South Africa's broad money to GDP

Source: Authors own computations. GDP: Gross domestic product, xSA: "Excluding South Africa," SADC: Southern African Development Community

countries. These spillovers could be regarded as indirect as they relate financial development to economic growth.

4.1.1. Bayesian VAR estimates

Table 2 shows the results of the BVAR system with GGDPPC and the four measures of financial development for South Africa as endogenous variables. A VAR system produces all results with each endogenous variable treated as a dependent variable. The results presented in Table 2, however, are only for the case when economic growth (GGDPPC) is the dependent variable.

BVAR estimates indicate that generally credit (both domestic and private credit) in South Africa has a positive spillover effect on growth of other SADC countries with the positive effect being more pronounced in the long-run. The monetary variables or the money market in South Africa has a negative spillover effect on growth of other countries. The effects are, however, consistently weak for all the financial development variables.

This BVAR system was tested for its stability and stationary using inverse roots of AR Characteristic Polynomial (Figure 1).

As a rule of thumb, a stable VAR should have the inverse roots that are within 1 point (that is the dots must fall within the circle). The VAR inverse roots of AR characteristics polynomial tests for stability and stationary establish that the estimated VAR system is stable. As such, the results are highly reliable as they were estimated by a stable VAR system.

4.1.2. Generalized IRFs[3]

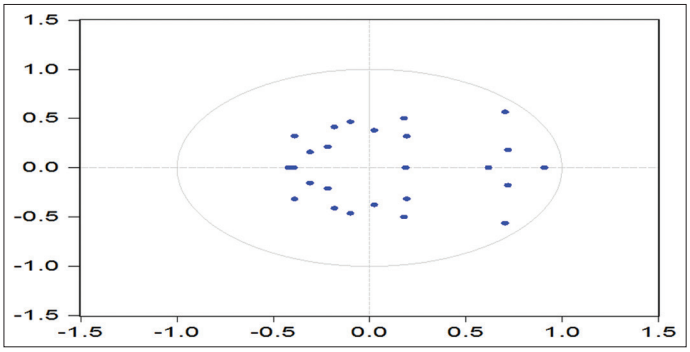
The results presented in this section depict the responses of the economic growth variable (GGDPPC) to shocks in financial variables in South Africa, in the BVAR model. Below is an analysis of the spillover effects of shocks in the credit and money market in South Africa.

4.1.2.1. Effects of a shock in SA's credit market

Figure 2 shows reaction of economic growth in SADC to shock in South Africa's credit market. A one standard deviation (SD) shock in DC in South Africa has a positive effect on growth of other SADC countries (GGDPPC). The positive effects remain sustainable in the first 6 periods before gradually easing out. This demonstrates existence of positive spillovers. A shock in BCP in South Africa results in a positive effect on growth in the first period, which becomes negative at the end of the second period before turning into positive in the 4th period and beyond.

Access to credit from offshore markets in South Africa could be supporting high growth rates in SADC countries. Increase in credit

Figure 1: Inverse roots of AR characteristic polynomial



Source: Author's own calculation

in South Africa generally infiltrates into other SADC countries either through financial institution branches and subsidiaries or through corporates that have subsidiaries or representation in other SADC countries. Naturally, increase in credit drives economic activity and output, thereby supporting growth.

In support of this argument, Mobolaji (2010) pointed out that credit in South Africa crowds-out DC in other countries. Efficiencies in the South Africa market make credit in other SADC countries more costly relative to credit from South Africa. As such, increase in spillovers of cheaper credit from South Africa could be driving growth in recipient countries as it substitutes a relatively expensive DC. Mobolaji (2010) pointed that firms are free to borrow from South African banks, attracted by lower cost of credit, better technology and service, and more competition, in the process crowding out DC markets. The increase in foreign credit support growth in recipient countries, especially in countries with strong resource based industries.

Furthermore, South Africa is the largest source of foreign direct investment mostly for smaller countries in SADC and a significant number of South African financial and non-financial firms are present within the SADC. Wanneburg G. (2016) pointed that the possible downgrade on South Africa's from Baa2 rating by Moody's in 2016 has a bad impact on the region given that many of the borrowers in the region access funding in South Africa. It will become more expensive for borrowers to fund capital projects if South Africa's credit rating is downgraded and this could affect their operations and overall growth in the country of operation.

4.1.2.2. Effects of a shock in SA's money market

Figure 3 depict the responses of the economic growth variable to shocks in money market variables in South Africa. A shock in South Africa's Broad Money generates the highest positive response in growth of other SADC countries in the first period when compared to other variables. The response turns to negative by the end of the 2nd period until the 5th period beyond which it becomes positive. A shock in LL in South Africa triggers a decline in growth of other SADC countries for the first 6 periods beyond which they become positive.

In the short term, a shock in the money market in South Africa sends negative spillover effects whilst the credit market exerts positive spillover effects to growth of other SADC countries. The

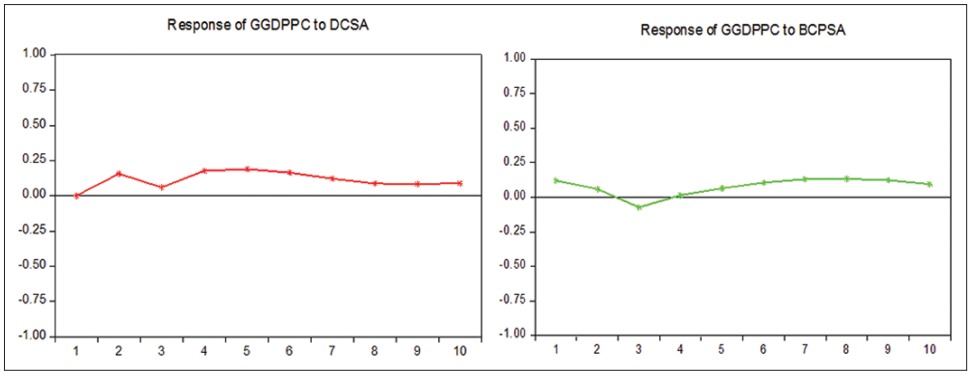
3 Impulse response functions usually show graphs with confidence intervals. Bayesian VAR models, however, do not show these intervals. To compensate for this, the study ran impulse response function on an unrestricted VAR model and produces the confidence intervals Confidence intervals for impulse response function are commonly based on Lutkepohl's (1990) asymptotic normal approximation or bootstrap approximations to that distribution (Runkle, 1987; Kilian, 1998a; 1999). On the graphs, the solid lines represent the impulse response function whilst the two broken lines shows the ±2 standard error or 95% confidence interval (Appendix Figure A1).

Table 2: BVAR Estimates finance-growth

BVAR estimates					
Sample (adjusted): 1990 2014					
Included observations: 350 After adjustments					
Standard errors in ( ) and t-statistics in [ ]					
GGDPPC(−1)	GGDPPC				
	0.253934	BCPSA(−1)	−0.013631	LLSA(−1)	−0.088697
GGDPPC(−2)	[5.47338]		[−0.17983]		[−0.68076]
	0.078142	BCPSA(−2)	−0.006473	LLSA(−2)	−0.093668
	[2.13606]		[−0.14493]		[−0.87178]
GGDPPC(−3)	0.027884	BCPSA(−3)	0.015288	LLSA(−3)	−0.043851
	[0.99264]		[0.48580]		[−0.57043]
GGDPPC(−4)	0.019647	BCPSA(−4)	0.004212	LLSA(−4)	0.000684
	[0.87544]		[0.17273]		[0.01106]
GGDPPC(−5)	0.014091	BCPSA(−5)	0.000423	LLSA(−5)	−0.001997
	[0.75872]		[0.02126]		[−0.03826]
DCSA(−1)	0.020504	M2SA(−1)	−4.299716	C	12.39059
	[0.81378]		[−0.55708]		[1.45632]
DCSA(−2)	−0.008840	M2SA(−2)	−1.163130		
	[−0.48453]		[−0.17216]		
DCSA(−3)	0.007700	M2SA(−3)	−2.149038		
	[0.56318]		[−0.45352]		
DCSA(−4)	0.005871	M2SA(−4)	−0.545047		
	[0.54663]		[−0.14958]		
DCSA(−5)	0.003749	M2SA(−5)	−0.154613		
	[0.42508]		[−0.05245]		
R^2			0.237276		
Adjustment R^2			0.178424		
F-statistic			4.031727		

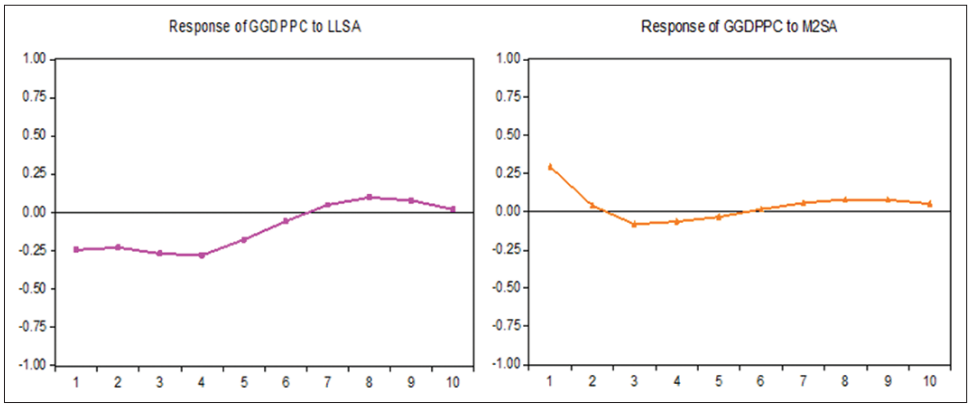
Source: Authors own computations. BVAR: Bayesian vector auto regression

Figure 2: Response of growth in real gross domestic product per capita to credit variables in South Africa



Source: Author's own calculation

Figure 3: Response of growth in real gross domestic product per capita to money market variables in South Africa



rationale for the negative effect of the money market could be the fact that increases in liquidity and broad money weakens the South African currency. The weaker currency drives growth-hurting imports from South Africa especially given trade imbalances of most SADC countries in favor South Africa.

Overall, the mixed responses of growth to positive shock in financial development in makes it difficult to determine the overall effects of a shock in South Africa's financial development on growth of SADC countries as the effects are cancelling out. There are, however, three observations that can be made out of the results. First, credit in South Africa generally has a positive spillover effects on growth of other SADC countries in both in the short and long run whist the money market has negative spillover effects in the short to medium term. Secondly, in the long run, South Africa's financial development across all the measures has positive spillover effects on growth in SADC.

Third, the IRFs graphs are very close to the axis indicating that the "vibrations" after the shocks are not vigorous. Implicitly the results are indicating that the spillovers from South Africa are not strong, possibly indicative of country specific common components outweighing regional common components (Kabundi and Loots, 2007). The third observation of weak spillovers can be checked by assessing the decomposition of variances of these impulse responses (Table 3).

4.1.3. Variance decomposition

Table 3 shows the decomposition the variances in economic growth (GGDPPC) to a shock in financial development in South Africa.

A shock, impulse or innovation to growth in real GDP per capita accounts for more than 98% to fluctuations in itself over the 10 periods, indicative of significant self-propelling effects. The results also show that all the financial development variables in South Africa account for a small or insignificant percentage fluctuation in growth of other SADC countries. In other words, fluctuations in growth in real GDP per capita variable cannot significantly be explained by other variables in the VAR model. The results implies that, taking the variances to represent spillovers, then spillover effects of financial development, though present, are not strong enough (implicitly they are weak) to explain growth of other SADC countries.

There are no known previous studies that have attempted to establish financial spillovers in SADC and comparison would be made with studies on real sector spillovers. The obtained results seem to support Basdevant et al. (2014) findings of no evidence of real growth spillovers from South Africa to the rest of the continent over the period 1960-2009. The implication of the results seems to be in line with Canales-Kriljenko et al. (2013) that shocks to real GDP growth in South Africa do not systematically affect growth developments in SACU countries as a group. The positive financial spillover effects in the long run across all financial development measures is, however, in sync with Basdevant et al. (2014) who find that a one percentage point increase in South Africa's long-term growth rate is associated with a ½-¾% increase in long-term growth rates in the rest of Sub-Saharan Africa. The positive spillovers could also be in line with Kabundi and Loots (2007) who find evidence of co-movement of the South African business cycle with nine SADC countries.

4.2. Direct Spillovers- Financial Development to Financial Development Spillovers

Financial spillovers from South Africa could also be directly affecting financial development of other SADC countries. In that regard, the study evaluated presence of finance-to-finance spillover effects in the SADC. Table 4 provides the BVAR estimated of the finance-to-finance model.

The VAR estimates show that South Africa's financial sector variables have insignificant effects on financial sector variables for other SADC countries (Table 4). Figure 4 shows graphs for impulse response of financial development in other SADC countries to one SD shock in the corresponding financial development measure in South Africa.

A positive shock to the financial sector in South Africa has a positive impact to both DC and private credit in SADC. In other words, SADC countries credit responds positively to positive one SD shocks in South Africa's financial sector. SADC DC is more responsive to shocks in South Africa's LL than it is to shock in credit variables. Bank private credit in SADC countries is highly receptive to innovations in South Africa's DC than other measures of the country's financial sector. The response in credit is relatively more significant than response of other financial development variables.

Figure 5 shows response of money market variables in SADC countries to changes in South Africa financial sector variables. LL of SADC countries are more responsive to shocks in South Africa's LL and DC particularly in the long run, that is after 7 periods. In the short run, however, a shock in South Africa's financial sector reduces LL in SADC countries. Broad money in SADC is more receptive to changes in DC in South Africa. As the case with credit, the response remains relatively weak compared to response in credit as the graphs are also close to zero over the entire 10 periods.

The study also checked the distribution of variances of the impulse responses carried out and the results are presented in Appendix Table A1. Decomposition of the variances of the given impulse responses in Figures 4 and 5 indicate constrained financial spillovers. Only DC in South Africa accounts for the highest proportion, at 1.5%, to other SADC countries' private credit. The results, thus, indicate weak finance-to-finance spillovers in SADC. The weak finance to finance spillovers are in contrary to theory which says that spillovers increase between countries and are strongest within sectors (IMF, 2016).

It can be noted, generally, that shocks in South Africa's financial system disperse positive effects into the SADC region, in the short and long run, indicating presence of positive financial spillovers. Notable spillovers are, however, realized in the credit markets of SADC countries and these would be generated from LL and DC of South Africa.

Table 3: Variance decomposition of GGDPPC

Variance decomposition of GGDPPC						
Period	**SE**	**GGDPPC**	**DCSA**	**BCPSA**	**M2SA**	**LLSA**
1	4.416595	100.0000	0.000000	0.000000	0.000000	0.000000
2	4.562748	99.76858	0.116096	0.063333	0.019817	0.032172
3	4.609805	99.43684	0.130345	0.223277	0.064263	0.145272
4	4.631747	98.98513	0.274330	0.351301	0.122809	0.266426
5	4.642453	98.70036	0.438752	0.399774	0.165649	0.295463
6	4.647588	98.56389	0.561981	0.400675	0.178591	0.294865
7	4.650632	98.45897	0.628927	0.418090	0.179183	0.314830
8	4.653814	98.34205	0.662823	0.463009	0.179934	0.352180
9	4.656405	98.24961	0.693881	0.499193	0.181264	0.376050
10	4.657832	98.20147	0.729687	0.507703	0.181202	0.379939

SE: Standard error

Table 4: BVAR estimates finance-finance

BVAR estimates sample (adjusted): 1987 2014 included observations: 384 after adjustments standard errors in ( ) and t-statistics in [ ]				
Dependent variable	**DC**	**LL**	**BCP**	**M2**
FD variable(−1)	0.791290	0.818375	0.839848	0.640390
	[22.0625]***	[23.7231]***	[23.7449]***	[16.7619]***
FD variable(−2)	0.136010	0.155866	0.098801	0.036568
	[3.92228]***	[4.56245]***	[2.82353]***	[1.16326]
DCSA(−1)	0.004628	−0.000637	0.033985	0.000164
	[0.08252]	[−0.02784]	[1.19359]	[0.30337]
DCSA(−2)	−0.036903	0.009783	−0.031557	−0.000206
	[−0.87903]	[0.57190]	[−1.48155]	[−0.51141]
LLSA(−1)	−0.278770	0.032752	−0.137564	−0.001493
	[−0.98106]	[0.28126]	[−0.94943]	[−0.54405]
LLSA(−2)	0.407588	0.059175	0.134062	0.001074
	[1.85889]*	[0.66023]	[1.20207]	[0.50898]
BCPSA(−1)	0.224350	−0.047700	0.046994	0.002116
	[1.23265]	[−0.63849]	[0.50546]	[1.20259]
BCPSA(−2)	0.047120	0.060832	−0.023245	−0.000269
	[0.43467]	[1.36243]	[−0.41828]	[−0.25563]
M2SA(−1)	4.053111	3.188457	5.334033	−0.019947
	[0.22453]	[0.43006]	[0.57771]	[−0.11427]
M2SA(−2)	−5.389022	−0.653603	−2.456232	−0.047775
	[−0.37001]	[−0.10932]	[−0.32964]	[−0.33983]
C	−13.90804	−6.043466	−2.374212	0.017051
	[−1.00825]	[−1.07436]	[−0.34012]	[0.12883]
GGDPPC	−0.084140	-0.101338	−0.070310	−0.003413
	[−0.66145]	[−1.99057]**	[−1.10594]	[−2.81554]***
TO	−0.011845	−0.001863	0.009376	0.000659
	[−0.83199]	[−0.29334]	[1.26602]	[4.62035]***
FO	0.883005	0.408083	0.436117	0.026661
	[1.90877]*	[2.05532]**	[1.85930]*	[5.91514]***
RINT	−0.002677	−0.002059	−0.000163	−0.000205
	[−0.10765]	[−0.22862]	[−0.01461]	[−0.97266]
R^2	0.893748	0.953001	0.896955	0.781900
Adjustment R^2	0.889717	0.951256	0.893128	0.773801
F-statistic	221.7056	546.0341	234.3998	96.54053

BVAR: Bayesian vector auto regression, DC: Domestic credit, BCP: Bank credit to private sector

Comparatively, finance-finance spillovers are relatively significant compared to finance-growth spillovers and highly so in the credit market than the money market. The interlinkage between South Africa and other countries, particularly neighboring countries, through monetary agreement, use of the South Africa Rand, monetary and fiscal linkages, exchange rate policy linkages and cooperation in monetary issues combine to support positive spillovers in financial development. South Africa's presence in the region is spread across the entire financial sector including banking, insurance, investment management, the stock market and non-financial sectors (Canales-Kriljenko et al., 2013). Ntswane (2014) finds that that South Africa's Fitch, Moody's and S&P issued ratings have a positive relationship with both portfolio bond and commercial bank and other private institutions net flow rates in other countries.

Figure 4: Domestic credit and liquid liabilities impulse responses. (a) Response of DC to cholesky one S.D. innovations. (b) Response of BCP to Cholesky one S.D. innovations

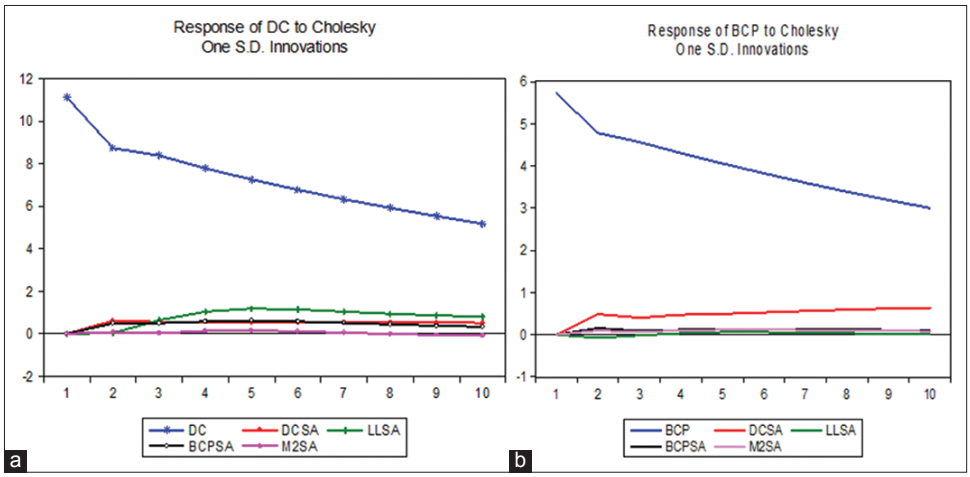
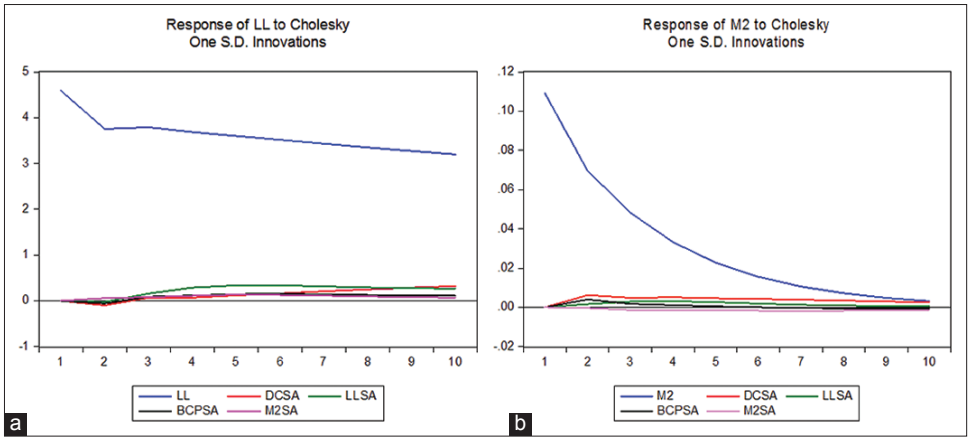


Figure 5: Liquid liabilities and broad money impulse responses. (a) Response of LL to Cholesky one S.D. innovations. (b) Response of M2 to Cholesky one S.D. innovations



Source: Author's own calculation. (a) DC: Domestic credit in Southern African Development Community (SADC) excluding SA (b) LL: Liquid liabilities in SADC excluding SA (c) BCP: Bank credit to private sector in SADC excluding SA (d) broad money in SADC excluding SA

Spillovers, however, generally are constrained possibly due to limited absorption capacity of financial systems in these countries. Spillover effects are weighed down by underdeveloped financial systems of some SADC countries that reduce their receptiveness to any spillovers from South Africa.

The low or weak spillovers in the financial sector could possibility be a result of financial "spillbacks" from other SADC counties into South Africa that cancels out South Africa financial spillovers into the SADC. Institutions and companies that receive credit from South Africa make repayments back to South Africa and coupled by financial leakages and outflows prompted by trade deficits with South Africa, there bound to be financial spillbacks. Mafusire and Leigh (2014) noted that financial institutions in Swaziland channel their locally mobilized resources to the South African market for investment purposes. Furthermore, any increase in domestic demand in these countries, result in increase in imports, mostly from South Africa due to domestic production constraints. As such, increase in imports from the financially developed country slows down or re-exports financial spillovers.

As such, if such flows are aggregated across countries, the net effect of financial spillovers from South Africa to other SADC countries is diluted. In other words, although this is not empirically tested, the result are suggesting that any financial flows from South Africa into SADC countries are retracing back to South Africa before they have a significant impact on the recipient country's financial sector or economic growth.

5. CONCLUSION

The study assesses the effects and magnitude of financial spillovers from South Africa on growth and financial sector of other SADC countries. The results indicate presence of positive spillovers from South Africa's financial sector to economic growth of other SADC countries. This study also established that South Africa financial system exerts positive spillover effects on financial sectors of other SADC countries. Impulse responses and variance decompositions, however, confirm relative stronger spillover effects on credit markets and slightly less strong effect on the money market South Africa financial spillover effects

in SADC. The study established that spillovers are, however, relatively low.

The results provide evidence that the financial sector, with additional support, could effectively transmit financial spillovers, especially credit, from South Africa. The relatively constrained financial spillover effects outcome, however, brought evidence that inter linkages in the financial sector within SADC presumably support real spillovers than financial spillovers. Evidently, literature confirms existence of real sector co-movements between South Africa and some SADC countries (Kabundi and Loots, 2007), some SSA countries (Basdevant et al., 2014) and SACU countries (Canales-Kriljenko et al., 2013). The results could also mean that South Africa does not send out significant spillovers to SADC members despite the inter-linkage. It could also imply that interconnectedness in financial systems in SADC works toward consolidating financial development in South Africa with minimal benefits to other countries.

The relatively weak spillover effects outcome gives credence to the imbalances in financial development in SADC as weak financial spillovers imply South Africa's financial development is not significantly spreading across other countries. The low financial spillover effects on growth and financial development, however, could imply that other SADC countries are insulated from direct adverse effects of financial shocks and crises that affect South Africa. Presence of spillovers implies that any negative shocks in South Africa's financial sector have an impact on SADC countries, although the impact would be very minimal. On the contrary, weak spillovers imply other SADC countries would not be able to realise any gains from growth and booms in global financial markets that are directly affecting South Africa.

Although the results indicate present of positive financial spillover effects on both growth and financial development of other SADC countries, it is important that SADC countries continue to strengthen their financial linkages with South Africa in order to enhance their growth and financial sector development. One approach to could be promoting financial integration in the region. Financial integration set a platform for direct support of financial development in other countries by South Africa. Theory says that financial market integration strengthens the role of financial factors in transmitting financial spillovers relative to trade linkages IMF (2016).

5.1. Disclaimer

The views expressed in this paper are those of the authors and do not necessarily coincide with those of the Agricultural Bank of Zimbabwe or Nelson Mandela University.

REFERENCES

Adusei, M. (2012), Financial development and economic growth: Is Schumpeter right? British Journal of Economics, Management and Trade, 2(3), 265-278.

Angkinand, A.P., Barth, J.R., Kim, H. (2009), Spillover Effects from the U.S. Financial Crisis: Some Time-Series Evidence from National Stock Returns, A Chapter in The Financial and Economic Crises: An International Perspective, Benton Group, Editor, Edward Elgar Publishing. Available from: http://www.harbert.auburn.edu/~barthjr/publications/Spillover%20effects%20from%20the%20U.S.%20financial%20crisis.pdf.

Arora, V., Vamvakidis, A. (2005), The Implications of South African Economic Growth for the Rest of Africa, IMF Working Paper, No. WP/05/58. Washington: International Monetary Fund.

Baldacci, E., Dell'Erba, S., Poghosyan, T. (2013), Spatial spillovers in emerging market spreads. Empirical Economics, 45(2), 735-756.

Banbura, M., Giannone, D., Reichlin, L. (2010), Large Bayesian vector auto regressions. Journal of Applied Econometrics, 25, 71-92.

Basdevant, O., Jonelis, A., Mircheva, A., Slavov, S. (2014), The mystery of missing real spill-overs in Southern Africa: Some facts and possible explanations. Cataloguing-in-Publication, Joint Bank-Fund Library. USA: International Monetary Fund.

Beaton, K., Desroches, B. (2011), Financial Spillovers across Countries: The Case of Canada and The United States, Bank of Canada, Discussion Paper. Available from: http://www.banqueducanada.ca/wp-content/uploads/2011/01/dp11-1.pdf.

Beck, T., Ross, L., Norman, L. (2000), Finance and the sources of growth. Journal of Financial Economics, 58, 261-300.

Berkowitz, B., Ramkolowan, Y., Stern, M., Venter, F., Webb, M. (2012), The Role of South African Business in Africa: South African Outward Investment, NEDLAC Fund for Research into Industrial Development, Growth and Equity (FRIDGE), Trade and Industry Chamber.

Brugal, I. (2012), Heterogeneous Spill-Over Index in Latin America, Superintendence of Banks, Dominican Republic. Available from: http://www.libir.soka.ac.jp/pdf.

Canales-Kriljenko, J.I., Gwenhamo, F., Thomas, S. (2013), Inward and Outward Spill-Overs in The SACU Area, IMF Working Paper, No. WP/13/31, African Department, International Monetary Fund.

Canova, F., Ciccarelli, M. (2013), Panel vector autoregressive models: A survey the views expressed in this article are those of the authors and do not necessarily reflect those of the ECB or the eurosystem. In: VAR Models in Macroeconomics-New Developments and Applications: Essays in Honor of Christopher A, Sims, Advances in econometrics. London: Emerald Group Publishing Limited. p205-246.

Christensen, B.V. (2014), Financial Integration in Africa: Implications for Monetary Policy and Financial Stability, BIS Paper No. 76c.

Ciccarelli, M., Ortega, E., Valderrama, M.T. (2012), Heterogeneity and Cross-Country Spillo^{ve}rs In macroeconomic Financial Linkages, Working Paper Series No. 1498. Available from: https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1498.pdf.

Drakos, K., Konstantinou, P.T. (2011), Terrorism Shocks and Public Spending: Panel VAR Evidence from Europe (No. 48), Economics of Security Working Paper.

Duncan, A., Kabundi, A. (2011), Volatility Spillovers Across South African Asset Classes During Domestic and Foregin Financial Crises, Economic Research of Southern Africa, Working Paper No. 202.

Enders, W. (1995), Applied Econometric Time Series. 1st ed. New York: John Wiley and Sons Inc.

Fic, T. (2013), The Spillover Effects of Unconventional Monetary Policies in Major Developed Countries on Developing Countries, Department of Economic and Social Affairs (DESA) Working Paper No. 131, National Institute of Economic and Social Research. Available from: http://www.un.org/esa/desa/papers/2013/wp131_2013.pdf.

Ghirmay, T. (2004), Financial development and economic growth in Sub-Saharan African countries: Evidence from time series analysis. African Development Bank, 16(3), 415-432.

Gil-Lafuente, A.M., Gil-Lafuente, J., Merigó-Lindahl, J. (2012), Soft

Computing in Management and Business Economics. Vol. 2. New York: Springer.

Gębka, B., Serwa, D. (Un Dated), Are Financial Spillovers Stable Across Regimes? Evidence from the 1997 ASIAN Crisis, European University Viadrina Frankfurt (Oder), Germany. Available from: http://www.papers.ssrn.com/sol3/papers.cfm?abstract_id=721583.

Hassan, M.K., Sanchez, B., Yu, J.S. (2011), Financial development and economic growth: New evidence from panel data. The Quarterly Review of Economics and Finance, 51(1), 88-104.

IMF. (2013), Dancing together? Spill-overs, common shocks and the role of financial and trade linkages. World Economic Outlook: Transitions and Tensions. Ch. 3. Available from: https://www.imf.org/external/pubs/ft/weo/2013/02/pdf/c3.pdf.

IMF. (2016), Global Financial Stability Report: Potent Policies for a Successful Normalization. Available from: http://www.imf.org.

Kabundi, A., Loots, E. (2007), Co-movement between South Africa and the Southern African Development Community: An empirical analysis. Economic Modelling, 24, 737-748.

King, R.G., Levine, R. (1993a), Finance and growth: Schumpeter might be right. Quarterly Journal of Economics, 108, 717-738.

Koop, G.M. (2013), Forecasting with medium and large Bayesian VARs. Journal of Applied Econometrics, 28(2), 177-203.

KPMG. (2014), Banking in Africa, KPMG's 2014 Banking Sector Report. Available from: http://www.kpmg.com/africa/en/issuesandinsights/articles-publications/general-industries-publications/pages/banking-in-africa.aspx.

Lada, K., Wojcik, P. (2007), A VAR model-the impact of a macroeconomic policy on inflation and economic activity. Atlantic Economic Journal, 22, 1-7.

Lawrence, P., Longjam, I. (2003), Financial Liberalisation in India: Measuring Relative Progress, Keele Economics Research Papers Kerp 2003/2008. Available from: http://www.citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.10.3293&rep=rep1&type=pdf.

Lin, J.L. (2006), Teaching Notes on Impulse Response Function and Structural VAR. Taipei: Institute of Economics, Academia Sinica, Department of Economics, National Chenguchi University. p1-9.

Litterman, R. (1986), Forecasting with Bayesian vector auto-regressions-five years of experience. Journal of Business and Economic Statistics, 4, 25-38.

Mafusire, A., Leigh, F. (2014), African Economic Outlook. Swaziland. Available from: http://www.africaneconomicoutlook.org.

Mishra, P., Montiel, P.J., Spilimbergo, A. (2010), Monetary Transmission in Low Income Countries, IMF Working Papers. p1-42.

Mobolaji, H.I. (2010), Spatial externality, openness and financial development in Sub-Saharan Africa (SSA) countries. The African Finance Journal, 12(1), 53-71.

Nissanke, M. (2009), The Global Financial Crisis and The Developing World: Transmission Channels and Fall-Outs for Industrial Development, Working Paper 06/2009, University of London.

Ntswane, L. (2014), The Impact of Sovereign Credit Ratings on Capital Flows and Financial Markets in Africa, Unpublished PhD Thesis. Johannesburg, South Africa: University of the Witwatersrand.

Ruch, F. (2013), The Impact of International Spillovers on the South African Economy South African Reserve Bank, Working Paper WP/13/02. Available from: https://www.resbank.co.za/Lists/News%20and%20Publications/Attachments/5705/WP1302.pdf.

Shan, J., Jianhong, Q. (2006), Does financial development 'lead' economic growth? The case of China. Annals of Economics and Finance, 1, 197-216.

Shinagawa, Y. (2014), Determinants of Financial Market Spillovers: The Role of Portfolio Diversification, Trade, Home Bias, and Concentration, International Monetary Fund, Working Paper WP/14/187. Available from: http://www.img.org.

Sims, CA., Zha, T. (1998), Bayesian methods for dynamic multivariate models. International Economic Review, 39, 949-968.

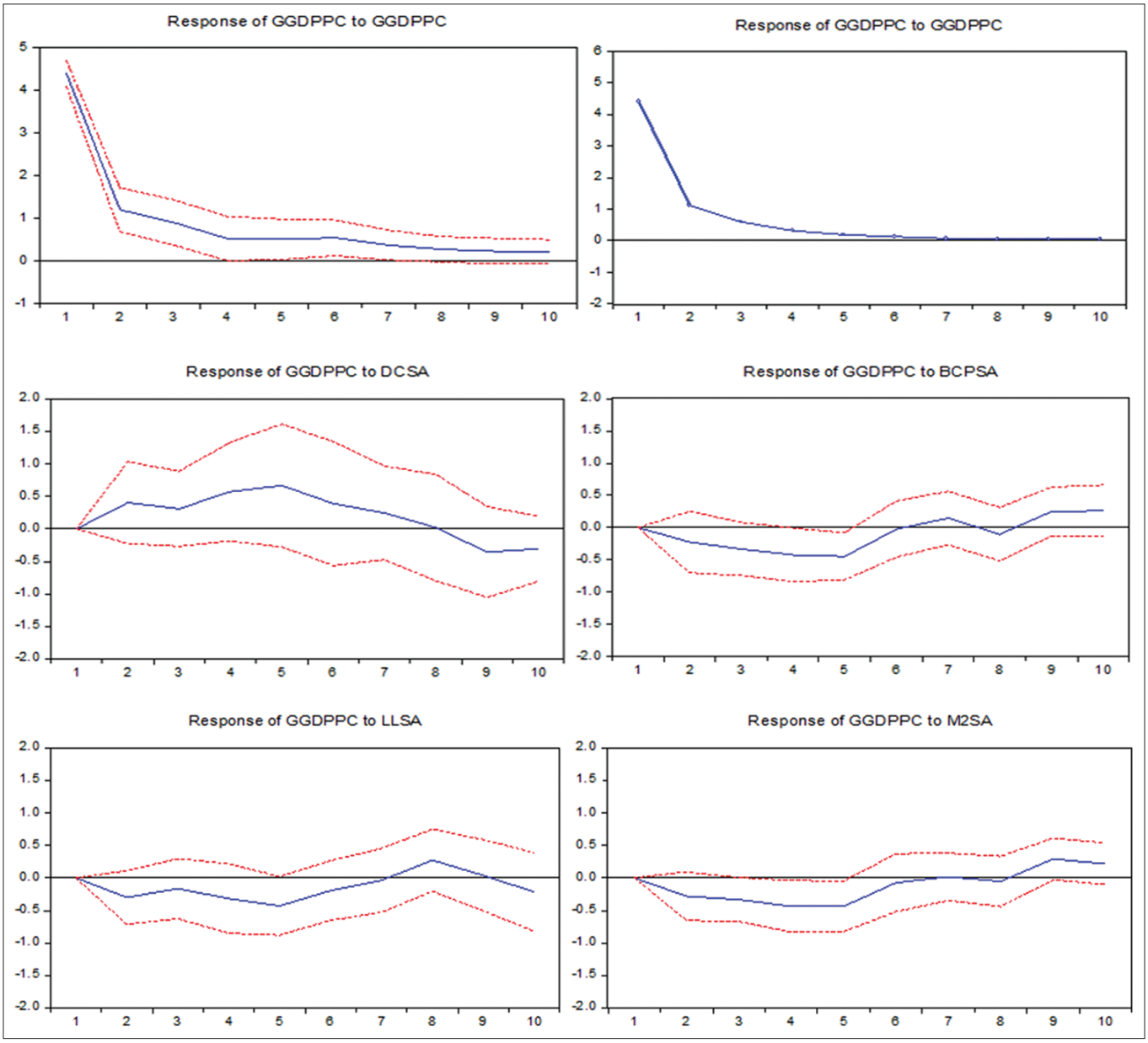
Wanneburg, G. (2016), Understanding South Africa's credit rating and its effects on Namibian investors. Getbiz Business and Economy. Available from: http://www.getbiz.co.za/index.php/biz-news/business-and-economy/301-credit-downgrade-will-have-ripple-effects-on-sa-s-neighbours.

Yildirim, J., Öcal, N., Erdogan, M. (2008), Financial Development and Economic Growth in Turkey: A Spatial Effect Analysis. Available from: http://www.ecomod.net/sites/default/files/document-conference/ecomod2008/611.pdf.

APPENDIX

APPENDIX FIGURE

Appendix Figure A1: Impulse response functions with confidence intervals



APPENDIX TABLE

Appendix Table A1: Variance decomposition financial development variables

(a) Variance decomposition of DC						
Period	**SE**	**DC**	**DCSA**	**LLSA**	**BCPSA**	**M2SA**
1	11.12123	100.0000	0.000000	0.000000	0.000000	0.000000
2	14.16364	99.69193	0.183392	0.000668	0.121084	0.002924
3	16.48889	99.41622	0.249744	0.151088	0.180607	0.002346
4	18.28053	98.99975	0.298238	0.448739	0.246184	0.007093
5	19.72080	98.60310	0.329747	0.747784	0.307456	0.011910
6	20.89725	98.31175	0.357972	0.966539	0.350224	0.013515
7	21.87130	98.11950	0.386500	1.107448	0.373722	0.012826
8	22.68699	97.99015	0.414940	1.198824	0.384135	0.011946
9	23.37611	97.89514	0.441501	1.264009	0.387569	0.011785
10	23.96199	97.81919	0.464765	1.315884	0.387856	0.012303
(b) Variance decomposition of LL						
Period	**SE**	**LL**	**DCSA**	**LLSA**	**BCPSA**	**M2SA**
1	4.588085	100.0000	0.000000	0.000000	0.000000	0.000000
2	5.931357	99.95083	0.027641	0.001511	0.009849	0.010169
3	7.042784	99.87568	0.029395	0.051803	0.023049	0.020076
4	7.956570	99.72500	0.030218	0.171057	0.038904	0.034825
5	8.743157	99.55305	0.043096	0.292156	0.059800	0.051902
6	9.432664	99.41623	0.065396	0.379164	0.076524	0.062686
7	10.04622	99.31354	0.099591	0.432325	0.086960	0.067580
8	10.59858	99.22972	0.144900	0.464253	0.092529	0.068603
9	11.10042	99.15204	0.199603	0.485335	0.095286	0.067735
10	11.55955	99.07435	0.261590	0.501307	0.096643	0.066107
(c) Variance decomposition of BCP						
Period	**SE**	**BCP**	**DCSA**	**LLSA**	**BCPSA**	**M2SA**
1	5.725128	100.0000	0.000000	0.000000	0.000000	0.000000
2	7.480133	99.50828	0.419487	0.011276	0.043066	0.017894
3	8.775491	99.42079	0.511238	0.008601	0.041373	0.018001
4	9.787968	99.27629	0.642112	0.008152	0.047218	0.026224
5	10.61016	99.13675	0.763008	0.010279	0.055621	0.034339
6	11.29293	98.99048	0.892359	0.011940	0.063654	0.041562
7	11.86803	98.83967	1.031241	0.012422	0.069935	0.046728
8	12.35782	98.68320	1.180025	0.012207	0.074454	0.050110
9	12.77859	98.52114	1.337179	0.011765	0.077681	0.052234
10	13.14260	98.35426	1.500824	0.011305	0.080069	0.053541
(d) Variance decomposition of M2						
Period	**SE**	**M2**	**DCSA**	**LLSA**	**BCPSA**	**M2SA**
1	0.109183	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.129762	99.65554	0.231383	0.016328	0.095912	0.000835
3	0.138599	99.50247	0.327270	0.059073	0.100705	0.010477
4	0.142661	99.33825	0.437938	0.104187	0.100734	0.018886
5	0.144574	99.20336	0.531106	0.135661	0.099341	0.030531
6	0.145494	99.09407	0.611918	0.151908	0.098094	0.044014
7	0.145947	99.00565	0.679100	0.159139	0.097957	0.058154
8	0.146177	98.93465	0.732953	0.162367	0.098877	0.071152
9	0.146299	98.87927	0.774559	0.164020	0.100289	0.081858
10	0.146365	98.83748	0.805813	0.165013	0.101701	0.089994

Source: Authors own computations. *(a) DC: Domestic credit in SADC excluding SA, (b) LL: Liquid liabilities in SADC excluding SA, (c) BCP: Bank credit to private sector in SADC excluding SA, (d) broad money in SADC excluding SA. SADC: Southern African Development Community, SE: Standard error